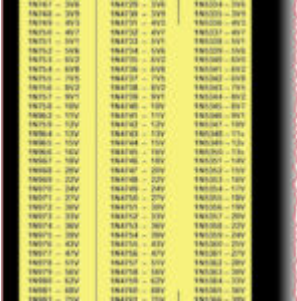


Zener Diode Series 1N746 to 1N5369

Overview

Category: Electronic
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1N746 - 3.3V	1N4733 - 10V	1N4734 - 10V
1N747 - 3.6V	1N4734 - 10V	1N4735 - 10V
1N748 - 4.0V	1N4735 - 10V	1N4736 - 10V
1N749 - 4.3V	1N4736 - 10V	1N4737 - 10V
1N750 - 4.7V	1N4737 - 10V	1N4738 - 10V
1N751 - 5.1V	1N4738 - 10V	1N4739 - 10V
1N752 - 5.6V	1N4739 - 10V	1N4740 - 10V
1N753 - 6.2V	1N4740 - 10V	1N4741 - 10V
1N754 - 6.8V	1N4741 - 10V	1N4742 - 10V
1N755 - 7.5V	1N4742 - 10V	1N4743 - 10V
1N756 - 8.2V	1N4743 - 10V	1N4744 - 10V
1N757 - 9.1V	1N4744 - 10V	1N4745 - 10V
1N758 - 10V	1N4745 - 10V	1N4746 - 10V
1N759 - 11V	1N4746 - 10V	1N4747 - 10V
1N760 - 12V	1N4747 - 10V	1N4748 - 10V
1N761 - 13V	1N4748 - 10V	1N4749 - 10V
1N762 - 15V	1N4749 - 10V	1N4750 - 10V
1N763 - 16V	1N4750 - 10V	1N4751 - 10V
1N764 - 18V	1N4751 - 10V	1N4752 - 10V
1N765 - 20V	1N4752 - 10V	1N4753 - 10V
1N766 - 22V	1N4753 - 10V	1N4754 - 10V
1N767 - 24V	1N4754 - 10V	1N4755 - 10V
1N768 - 27V	1N4755 - 10V	1N4756 - 10V
1N769 - 30V	1N4756 - 10V	1N4757 - 10V
1N770 - 33V	1N4757 - 10V	1N4758 - 10V
1N771 - 36V	1N4758 - 10V	1N4759 - 10V
1N772 - 40V	1N4759 - 10V	1N4760 - 10V
1N773 - 43V	1N4760 - 10V	1N4761 - 10V
1N774 - 47V	1N4761 - 10V	1N4762 - 10V
1N775 - 51V	1N4762 - 10V	1N4763 - 10V
1N776 - 56V	1N4763 - 10V	1N4764 - 10V
1N777 - 62V	1N4764 - 10V	1N4765 - 10V
1N778 - 68V	1N4765 - 10V	1N4766 - 10V
1N779 - 75V	1N4766 - 10V	1N4767 - 10V
1N780 - 82V	1N4767 - 10V	1N4768 - 10V
1N781 - 91V	1N4768 - 10V	1N4769 - 10V
1N782 - 100V	1N4769 - 10V	1N4770 - 10V

Zener diodes are essential components in voltage regulation and protection circuits. This guide provides a detailed overview of three popular power ratings: 0.5W, 1W, and 5W Zener diode series, covering part numbers from 1N746 to 1N5369 and voltage ranges from 3.3V to 100V. Whether you’re designing a power supply, voltage reference, or surge protection circuit, having a complete voltage chart at your fingertips is invaluable for selecting the right component.

SCE SCOOP

Category: Refrigeration
written by www.mbsmpro.com | December 22, 2025



Understanding the inner workings of a Secop SCE hermetic compressor is essential for any refrigeration technician or engineer. This comprehensive guide breaks down the complex internal components—from the crankshaft to the valve plate—providing a detailed exploded view. Whether you are troubleshooting or studying mechanical design, our professional analysis offers the clarity needed for modern cooling systems.

CR20-06 A-F-A-E-HQQE

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written by www.mbsmpro.com | December 22, 2025







The Grundfos CR20-06 A-F-A-E-HQQE is a vertical multistage centrifugal pump delivering 21 m³/h at 70.4 m head with a 7.5 kW IE3 motor, designed for demanding water boosting and industrial applications.

Its cast-iron base, stainless-steel internals and HQQE mechanical seal make it a durable, energy-efficient solution for process water, HVAC, boiler feed and general pressure boosting systems.

Introduction

In modern industry and building services, stable water pressure is no longer a luxury but a basic requirement. The Grundfos CR20-06 A-F-A-E-HQQE has become one of the quiet workhorses in this field, combining compact vertical design with serious performance for installations where downtime is simply not an option.

Technical profile of the CR20-06

The pump in the photo is clearly identified on its nameplate as a Grundfos CR20-06 A-F-A-E-HQQE with a 7.50 kW motor operating at 50 Hz and about 2919 rpm.

It delivers a nominal flow of 21 m³/h at a rated head of 70.4 m, with a maximum head up to 88.4 m and a maximum operating pressure of 16 bar at liquid temperatures up to 120 °C.

Main nameplate data

Item	Value
Pump type	CR20-06 A-F-A-E-HQQE
Rated power P2	7.5 kW
Frequency / speed	50 Hz / ≈2919 rpm
Rated flow Q	21 m³/h
Rated head H	70.4 m
Maximum head Hmax	88.4 m
Maximum pressure / temp.	16 bar / 120 °C
Shaft seal code	HQQE (single mechanical seal)
Pump orientation	Vertical, inline
Efficiency (pump)	≈75.6% (MEI ≥ 0.70)

The pump uses a vertical, inline layout with suction and discharge on the same level (DN 50 flanged connections, PN 25 rating), simplifying installation in compact plant rooms and on rigid pipe manifolds.

Its IE3 motor (size 132SB) offers motor efficiencies above 90% at typical loads, helping operators reduce long-term energy costs.

Construction, materials and seal

The CR20-06 belongs to the widely used CR multistage family, where several impellers are stacked in series to build pressure while maintaining moderate flow.

In this specific model, the base and pump head are in cast iron, while all wetted parts such as impellers and chambers are stainless steel AISI 304, providing a good balance between robustness and corrosion resistance for clean water duties.

The HQQE mechanical seal is a single cartridge seal with silicon carbide/silicon carbide faces, EPDM elastomers and a stainless-steel spring, designed for long service life and easy replacement.

This configuration suits cold and hot water, mildly aggressive media used in HVAC and process plants, and reduces the risk of dry-running damage during commissioning or transient operating conditions.

Typical applications and operating benefits

With its 21 m³/h at 70.4 m operating point, the CR20-06 is well suited to medium-pressure boosting in commercial buildings, industrial wash and rinse systems, boiler feed for small to mid-size boilers, and general process water circulation.

Installers appreciate the inline design, which often allows direct replacement of older horizontal pumps without major changes to the pipework, while plant operators value the quiet operation and low vibration levels of the multistage design.

From an energy perspective, the combination of high hydraulic efficiency and IE3 motor makes this model a strong candidate in projects where life-cycle cost analysis is required or where regulations demand a minimum efficiency index ($MEI \geq 0.70$).

Paired with an external frequency converter, the CR20-06 can be turned into a variable-speed booster, maintaining constant pressure in domestic water systems, process loops or district cooling circuits while cutting energy consumption during partial-load operation.

Practical selection notes for engineers

When selecting a CR20-06 for a project, engineers typically start from the required duty point on the pump curve and verify that 21 m³/h at around 70 m head fits the system's pressure losses, static height and safety margin.

System designers also check NPSH requirements, temperature range from -20 to 120 °C, and maximum ambient temperature up to 60 °C to ensure trouble-free operation in machinery rooms and outdoor installations.

Because the pump offers a maximum operating pressure of 16 bar with PN 25 flanges, it can be integrated into higher-pressure manifolds and ring mains, provided that upstream valves, fittings and vessels share compatible ratings.

For users planning future upgrades, the CR range gives a modular platform: additional models and variants can be combined in parallel booster sets, or replaced one-to-one if system demand

increases.